

Clean copy of Allowed Claims

1. A method for converting a vertically structured CAD/CAM model to a horizontally structured CAD/CAM model, comprising:
 - identifying a base modeling element of the vertically structured CAD/CAM model and establishing it as a base feature of the vertically structured CAD/CAM model;
 - establishing a parent coordinate system for the horizontally structured CAD/CAM model;
 - identifying a parent modeling element of the vertically structured CAD/CAM model, the parent modeling element including a plurality of modeling features dependent thereof;
 - identifying each dependency for each of a plurality of modeling features from said parent modeling element; and
 - converting an existing vertically structured CAD/CAM model to a horizontally structured CAD/CAM model by:
 - restructuring each dependency for each said modeling feature for placement with respect to the horizontally structured CAD/CAM model, such that each said modeling feature exhibits a direct associative relationship with a reference feature, said restructuring including;
 - determining if said modeling feature is dependent on an existing datum plane for placement;
 - for modeling features determined to be dependent on an existing datum plane for placement, performing at least one of:
 - configuring a new reference feature for placement of said modeling feature wherein said new reference feature is dependent on said parent coordinate system and establishing an

associative relationship between said modeling feature and said new reference feature, then deleting the dependency between the modeling feature and the existing datum plane,

reconfiguring said existing datum plane as a descendant of said parent coordinate system, and

establishing an associative relationship with at least one of said parent coordinate system and a reference feature dependent therefrom and deleting the dependency between the modeling feature and the existing datum plane.

2. The method of Claim 1 wherein said reference feature includes one of:

said parent coordinate system,

a child coordinate system exhibiting an associative relationship with said parent coordinate system,

a first datum plane exhibiting an associative relationship with at least one of said parent coordinate system and said child coordinate system, and

a second datum plane exhibiting an associative relationship with said first datum plane.

3. Canceled.

4. The method of Claim 1 further including identifying a primitive in said vertically structured CAD/CAM model.

5. The method of Claim 4 further including converting said primitive to a modeling feature.

6. The method of Claim 5 wherein said converting said primitive includes establishing a new feature corresponding to said primitive such that said new feature exhibits an associative relationship with at least one of said parent coordinate system and a child thereof for placement.

7. The method of Claim 6 wherein said associative relationship between the new feature and the at least one of the parent coordinate system and a child thereof is a parent/child relationship.

8. The method of Claim 1 wherein said base feature corresponds to a selected primitive element in said vertically structured CAD/CAM model.

9. Canceled.

10. Canceled.

11. The method of Claim 1 wherein said modeling feature dependent from said parent modeling element exhibits a parent child relationship with at least one of said parent modeling element and a descendent thereof such that placement of said dependent modeling

features is relative to said at least one of said parent modeling element and said descendent thereof.

12. Canceled.

13. Cancelled.

14. Canceled.

15. Canceled.

16. Canceled.

17. The method of Claim 1 wherein none of said modeling features exhibits an associative relationship with any other modeling feature.

18. The method of Claim 1 wherein none of said modeling features exhibits an associative relationship with said base feature.

19. The method of Claim 1 wherein said base feature exhibits an associative relationship with at least one of said parent coordinate system and a descendent thereof.

20. The method of Claim 1 wherein a descendent of said parent coordinate system includes at least one of a reference, point, line, datum plane and another coordinate system positioned and oriented relative to said parent coordinate system.

21. A system for converting a vertically structured CAD/CAM model to a horizontally structured CAD/CAM model, comprising:

a computer; and

a computer program executing on the computer, the computer program implementing a method, comprising:

identifying a base modeling element of the vertically structured CAD/CAM model and establishing it as a base feature of the vertically structured CAD/CAM model;

establishing a parent coordinate system for the horizontally structured CAD/CAM model;

identifying a parent modeling element of the vertically structured CAD/CAM model, the parent modeling element including a plurality of modeling features dependent therefrom; and

identifying each dependency for each of a plurality of modeling features from said parent modeling element;

converting an existing vertically structured CAD/CAM model to a horizontally structured CAD/CAM model by:

restructuring each dependency for each said modeling feature for placement with respect to the horizontally structured CAD/CAM model, such that each said modeling feature exhibits a direct associative relationship with a reference feature, said restructuring including:

determining if said modeling feature is dependent on an existing datum plane for placement;

for modeling features determined to be dependent on an existing datum plane for placement, performing at least one of:

configuring a new reference feature for placement of said modeling feature wherein said new reference feature is dependent on said parent coordinate system and establishing an associative relationship between said modeling feature and said new reference feature, then deleting the dependency between the modeling feature and the existing datum plane,

reconfiguring said existing datum as a descendant of said parent coordinate system, and

establishing an associative relationship with at least one of said parent coordinate system and a reference feature dependent therefrom and deleting the dependency between the modeling feature and the existing datum plane.

22. The system of Claim 21 wherein said reference feature includes one of:
- the parent coordinate system,
 - a child coordinate system exhibiting an associative relationship with said parent coordinate system,
 - a first datum plane exhibiting an associative relationship with at least one of said parent coordinate system and said child coordinate system, and
 - a second datum plane exhibiting an associative relationship with said first datum.

23. Canceled.

24. The system of Claim 21 wherein each associative relationship is a parent/child relationship.

25. The system of Claim 21 wherein said modeling feature exhibits an associative relationship with said base feature.

26. The system of Claim 21 wherein said base feature exhibits an associative relationship with at least one of said reference feature and a feature dependent thereon.

27. The system of Claim 21 further including identifying a primitive in said vertically structured CAD/CAM model.

28. The system of Claim 27 further including a new feature established by converting said primitive to a modeling feature corresponding to said primitive such that said new feature exhibits an associative relationship with at least one of said parent coordinate system and a child thereof for placement.

29. Canceled.

30. The system of Claim 21 wherein said base feature corresponds to a selected primitive in said vertically structured CAD/CAM model.

31. The system of Claim 21 wherein said reference feature comprises a coordinate system.

32. The system of Claim 31 wherein said coordinate system comprises:
a first datum plane;
a second datum plane; and
a third datum plane.

33. The system of Claim 32 wherein said first datum plane, said second datum plane, and said third datum plane are orthogonal.

34. The system of Claim 21 wherein said reference feature comprises at least one of said parent coordinate system, another coordinate system, a point, line curve, surface, and datum plane.

35. Canceled.

36. Canceled.

37. Cancelled.

38. Canceled.

39. Canceled.

40. Canceled.

41. The system of Claim 21 wherein none of said modeling features exhibits an associative relationship with any other said modeling feature.

42. The system of Claim 21 wherein none of said modeling features exhibits an associative relationship with said base feature.

43. Canceled.

44. The system of Claim 21 wherein a descendent of said parent coordinate system includes at least one of a reference, point, line, datum plane and another coordinate system positioned and oriented relative to said parent coordinate system.

45. A storage medium encoded with a machine-readable computer program code, wherein said storage medium includes instructions for causing a computer to implement a method for converting a vertically structured CAD/CAM model to a horizontally structured CAD/CAM model comprising:

identifying a base modeling element of the vertically structured CAD/CAM model and establishing it as a base feature of the vertically structured CAD/CAM model;

establishing a parent coordinate system for the horizontally structured CAD/CAM model;

identifying a parent modeling element of the vertically structured CAD/CAM model, the parent modeling element including a plurality of modeling features dependent thereof;

identifying each dependency for each of a plurality of modeling features from said parent modeling element; and

converting an existing vertically structured CAD/CAM model to a horizontally structured CAD/CAM model by:

restructuring each dependency for each said modeling feature for placement with respect to the horizontally structured CAD/CAM model, such that each said modeling feature exhibits a direct associative relationship with a reference feature, said restructuring including;

determining if said modeling feature is dependent on an existing datum plane for placement;

for modeling features determined to be dependent on an existing datum plane for placement, performing at least one of:

configuring a new reference feature for placement of said modeling feature wherein said new reference feature is dependent on said parent coordinate system and establishing an associative relationship between said modeling feature and said new reference feature, then deleting the dependency between the modeling feature and the existing datum plane,

reconfiguring said existing datum plane as a descendant of said parent coordinate system, and

establishing an associative relationship with at least one of said parent coordinate system and a reference feature dependent therefrom and deleting the dependency between the modeling feature and the existing datum plane.

46. (Canceled)